

DEPARTMENT: OF AGRICULTURE

STATE OF MINNESOTA

Office Memorandum

DATE: October 11, 2006

TO: Pam Shubat, Health Risk Assessment Unit, MDH

FROM: Paul McNelly, Incident Response Unit, MDA
Cathy Villas-Horns, Incident Response Unit, MDA

PHONE: 201-6560

SUBJECT: **Request for Review of Standards for Heavy Metals in Fertilizer Materials**

We are writing to formally request your office to conduct a review of available standards for heavy metals in fertilizers with respect to the current Minnesota standard. This request is being made due to concerns raised by Minnesota Department of Health (MDH) staff and others regarding the concentrations of heavy metals allowed in fertilizer products that can be used in Minnesota.

As you are aware, in 2003 the legislature amended the fertilizer law to prohibit the sale or use of fertilizers in Minnesota which contain more than 500 parts per million by weight of arsenic. Concurrently, both MDH and Minnesota Department of Agriculture (MDA) staff have been involved with a U.S. Environmental Protection Agency (EPA) investigation and cleanup of arsenic contaminated residential soil in South Minneapolis. The contamination of residential yards is believed to be largely caused by the windblown deposition of powdered arsenic from a former pesticide manufacturer although other sources of arsenic such as ash and agricultural chemicals may have had some effect. In light of the knowledge gained from the residential cleanup and the recent publication of further evaluations of the concentrations of heavy metals in fertilizers MDH and MDA staff have questioned the appropriateness of the concentrations of heavy metals allowed in fertilizer products sold in Minnesota.

Background: In 1998, at the request of the MDA, the MDH reviewed health based information regarding heavy metals in fertilizers. The review was conducted by Mr. Chuck Stroebel who provided his findings in a report titled "Screening Evaluation of Arsenic, Cadmium, and Lead Levels in Minnesota Fertilizer Products, April 1999."

Information reviewed for this report included: fertilizer sample analysis data (heavy metals) and other documents provided by the MDA, information from the Canadian Food Inspection Agency, US Department of Agriculture, EPA, Washington State Department of Health, California Department of Food and Agriculture and several fertilizer companies. Also, included as part of the MDH evaluation was a review of a risk assessment completed in 1998 by the California Department of Food and Agriculture (CDFA).

Since the MDH report was released, the EPA completed a risk assessment for inorganic fertilizers which was made available in draft form in September 1999. In addition, a second external scientific peer review of the 1998 California risk assessment was required prior to the CDFA adopting heavy metals regulations. Based on this review significant revisions were incorporated resulting in a new (lower) set of standards being recommended. California adopted the new standards January 1, 2002.

Background: cont.

In 2002 the EPA amended its rule regarding zinc fertilizers made from recycled hazardous secondary materials. Furnace dust from the steel industry, otherwise designated as a hazardous waste with the code KO61 under the Resource Conservation and Recovery Act (RCRA), was a common source for the micronutrient zinc. KO61, known to contain significant levels of lead and cadmium, previously was exempt from most EPA hazardous waste regulations, when recycled for beneficial reuse such as a fertilizer. While this material can be used as a fertilizer material, the amended rule has imposed stricter limits on contaminants. The KO61 derived zinc oxysulfate fertilizers may have been a source of heavy metals in fertilizers based on previous MDA metals analysis.

In 2003 the Minnesota Legislature made a change to the Minnesota Fertilizer Law, Minnesota Statutes Chapter 18C regarding arsenic concentrations in fertilizers. Minnesota Statutes 18C.401, Subd. 5 specifically regulates only one metal, arsenic (As), "The commissioner may not license or register for sale or use in Minnesota any fertilizer containing more than 500 parts per million by weight of arsenic." The 500 ppm level is not a risk based number; it is instead an interim standard chosen because it was believed to be a level that would effectively regulate products with exceptionally high concentrations of heavy metals out of the channels of trade. This legislation along with actions in other states and by other organizations was successful in removing fertilizer products with high concentrations of arsenic from Minnesota.

Also, in 2003 the Association of American Plant Food Control Officials (AAPFCO) adopted, as part of their model legislation, a risk-based assessment for nine (9) metals in fertilizers. AAPFCO's Statement of Uniform Interpretation and Policy #25 Heavy Metal Rule is based primarily on a risk assessment study commissioned by The Fertilizer Institute (an industry trade organization) and prepared by The Weinberg Group, Inc., Washington, DC. The exposure pathways evaluated for this study focused on the exposure to a farm family (including children) via ingestion of treated crops, unintentional ingestion of fertilized soil, and dermal contact with fertilized soil. The EPA does not accept or dispute the validity of AAPFCO's SUIP 25 but believes that fertilizer materials can and should have lower heavy metal content than that allowed by AAPFCO when appropriate technology is available.

If you need copies of any of the listed references or would like additional information, please contact Paul McNelly at (651) 201-6560 or Cathy Villas-Horns at (651) 201-6293.

References:

EPA's DRAFT risk assessment "Estimating Risk from Contaminants Contained in Agricultural Fertilizers," September 1, 1999; website address www.epa.gov/epaoswer/hazwaste/recycle/fertiliz/risk/report.pdf

AAPFCO's Statement of Uniform Interpretation and Policy (SUIP) #25 "The Heavy Metal Rule", Page 62, Official Publication No 59, 2006 <http://www.aapfco.org/aapfcorules.html>

Scientific Basis for Risk-Based Acceptable Concentrations of Metals in Fertilizers and Their Applicability as Standards, The Weinberg Group Inc., July 9, 2001 <http://www.aapfco.org/RBCWhite.pdf>

Health Risk Evaluation of Select Metals in Inorganic Fertilizers Post Application, The Weinberg Group Inc., January 16, 2000. <http://www.aapfco.org/tfiRiskStd.pdf>

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References: cont.

Better Rules for Zinc Fertilizer Recycling, Environmental Protection Agency (EPA),
<http://www.aapfco.org/EPAFINALZinc.htm>

40 CFR Parts 261, 266, 268 and 271 Zinc Fertilizers Made from Recycled Hazardous Secondary
Materials, Final Rule. Environmental Protection Agency (EPA), <http://www.aapfco.org/EPAZinc07-15.htm>

Minnesota Statutes Chapter 18C, The Minnesota Fertilizers, Soil Amendments, Agricultural Liming
Materials, and Plant Amendments Law,
<http://www.revisor.leg.state.mn.us/data/revisor/statutes/2005/18C/>

Screening Evaluation of Arsenic, Cadmium, Lead Levels in Minnesota Fertilizer Products, Minnesota
Department of Health, 1999.

Development of Risk-Based Concentrations for Arsenic, Cadmium, and Lead in Inorganic commercial
Fertilizers, prepared for California Department of Food and Agriculture and the Heavy Metal Task Force
by Foster Wheeler Environmental Corporation, March 1998

Supplement to the Development of Risk-Based Concentrations for Arsenic, Cadmium, and Lead in
Inorganic commercial Fertilizers, prepared for California Department of Food and Agriculture by MWH,
June 2002

Evaluation of Heavy metals & Dioxin in Inorganic Commercial Fertilizers and California Cropland Soils,
California Department of Food and Agriculture, December 2004

cc: Daniel Pena, MDH
Rita Messing, MDH
Chuck Stroebel, MDH

Fertilizer Heavy Metal Analysis

AGRIUM US INC
4582 ULSTER ST STE 1700
DENVER, CO 80237

LAB NO	PRODUCT	ANALYTEDES	CLAIM	FOUND
00002920	ULTRA YIELD CORN MIX	Sulfur	9.00	9.85 %
		Manganese	4.00	6.87 %
		Zinc	20.00	15.30 %
		Arsenic	0.00	14.00 ppm
		Cadmium	0.00	<4.00ppm
		Lead	0.00	197.00 ppm
		Mercury	0.00	<0.50 ppm
00002921	ULTRA YIELD BEAN MIX	Sulfur	9.00	7.40 %
		Manganese	20.00	19.90 %
		Zinc	4.00	4.70 %
		Arsenic	0.00	45.60 ppm
		Cadmium	0.00	<4.00 ppm
		Lead	0.00	134.00 ppm
		Mercury	0.00	<0.50 ppm

AGRIUM US INC
P O BOX 383
REESE, MI 48757

LAB NO	PRODUCT	ANALYTEDES	CLAIM	FOUND
00002574	ULTRA YIELD CORN MIX	Sulfur	9.00	9.92 %
		Manganese	4.00	6.20 %
		Zinc	20.00	17.20 %
		Arsenic	0.00	22.00 ppm
		Cadmium	0.00	3.00 ppm
		Lead	0.00	341.00 ppm
		Mercury	0.00	<0.50 ppm

AMERICAN MICROTRACE CORP
569 CENTRAL DR, STE 201
VIRGINIA BEACH, VA 23454

LAB NO	PRODUCT	ANALYTEDES	CLAIM	FOUND
00001328	SUPER-MAN-GRO MANGANESE SULFATE	Total Nitrogen	0.00	0.00 %
		Avail Phosphate	0.00	0.00 %
		Soluble Potash	0.00	0.00 %
		Sulfur	18.00	18.00 %
		Manganese	32.00	32.10 %
		Arsenic	0.00	<41.00 ppm
		Cadmium	0.00	<20.00 ppm
00001356	GRANULAR MANGANESE SULFATE 29% (MN)	Total Nitrogen	0.00	0.00 %
		Avail Phosphate	0.00	0.00 %
		Soluble Potash	0.00	0.00 %
		Sulfur	17.00	16.20 %
		Manganese	29.00	28.40 %
		Arsenic	0.00	<41.00 ppm
		Cadmium	0.00	<20.00 ppm
	Lead	0.00	29.00 ppm	

Fertilizer Heavy Metal Analysis

AMERICAN MICROTRACE CORP (cont.)

00001517	ZINC-GRO 35.5% ZN	Total Nitrogen	0.00	0.00 %
		Avail Phosphate	0.00	0.00 %
		Soluble Potash	0.00	0.00 %
		Sulfur	17.50	17.20 %
		Zinc	35.50	35.80 %
		Arsenic	0.00	<1.00 ppm
		Cadmium	0.00	<20.00 ppm
		Lead	0.00	<20.00 ppm

B & L AGRONOMICS 107 HWY 63 S, P O BOX 93 RACINE, MN 55967-0097

LAB NO	PRODUCT	ANALYTEDES	CLAIM	FOUND
00001378	CAL PHOS 0-3-0	Total Nitrogen	0.00	0.00 %
		Avail Phosphate	3.00	6.41 %
		Soluble Potash	0.00	0.00 %
		Arsenic	0.00	<41.00 ppm
		Cadmium	0.00	<20.00 ppm
		Lead	0.00	<20.00 ppm
00001379	COMPOST 4-5-4	Total Nitrogen	4.00	3.66%
		Avail Phosphate	5.00	4.78 %
		Soluble Potash	4.00	3.61 %
		Calcium	20.00	10.70 %
		Arsenic	0.00	<41.00 ppm
		Cadmium	0.00	<20.00 ppm
		Lead	0.00	<20.00 ppm
00001380	11-52-0	Total Nitrogen	11.00	8.68 %
		Avail Phosphate	52.00	40.50 %
		Soluble Potash	0.00	0.00 %
		Arsenic	0.00	<41.00 ppm
		Cadmium	0.00	<20.00 ppm
		Lead	0.00	<20.00 ppm
00001381	0-0-50 17S	Total Nitrogen	0.00	0.00 %
		Avail Phosphate	0.00	0.00 %
		Soluble Potash	50.00	49.00 %
		Sulfur	17.00	18.10 %
		Arsenic	0.00	<41.00 ppm
		Cadmium	0.00	<20.00 ppm
		Lead	0.00	<20.00 ppm

BELLE PLAINE COOP 820 MAIN ST E BELLE PLAINE, MN 56011

LAB NO	PRODUCT	ANALYTEDES	CLAIM	FOUND
00001432	0-46-0	Total Nitrogen	0.00	13.30 %
		Avail Phosphate	46.00	47.60 %
		Soluble Potash	0.00	0.00 %
		Arsenic	0.00	3.4 ppm
		Cadmium	0.00	<20.00 ppm
		Lead	0.00	<20.00 ppm

Fertilizer Heavy Metal Analysis

BLACK DIAMOND ORGANICS
202 2ND ST NE, P O BOX 908
CONCORDIA, MO 64020-0908

LAB NO	PRODUCT	ANALYTEDES	CLAIM	FOUND
00001341	BLACK DIAMOND BLOOD MEAL PLUS 6-0-0	Total Nitrogen	6.00	7.97 %
		Avail Phosphate	0.00	0.00 %
		Soluble Potash	0.00	0.00 %
		Magnesium	4.00	3.00 %
		Iron	2.00	1.80 %
		Arsenic	0.00	<41.00 ppm
		Cadmium	0.00	<20.00 ppm
		Lead	0.00	41.00 ppm

CANTON MILLS
160 MILL ST, BOX 97
MINNESOTA CITY, MN 55959

LAB NO	PRODUCT	ANALYTEDES	CLAIM	FOUND
00001333	CALCIUM SULFATE	Total Nitrogen	0.00	0.00 %
		Avail Phosphate	0.00	0.00 %
		Soluble Potash	0.00	0.00 %
		Calcium	23.00	22.10 %
		Sulfur	17.00	16.10 %
		Arsenic	0.00	<41.00 ppm
		Cadmium	0.00	<20.00 ppm
		Lead	0.00	<20.00 ppm
00001332	CALPHOS 0-3-0	Total Nitrogen	0.00	0.00 %
		Avail Phosphate	3.00	3.25 %
		Soluble Potash	0.00	0.00 %
		Arsenic	0.00	<41.00 ppm
		Cadmium	0.00	<20.00 ppm
		Lead	0.00	<20.00 ppm
00001334	10-50-0	Total Nitrogen	10.00	10.30 %
		Avail Phosphate	50.00	50.20 %
		Soluble Potash	0.00	0.00 %
		Arsenic	0.00	<41.00 ppm
		Cadmium	0.00	<20.00 ppm
		Lead	0.00	<20.00 ppm
00001335	LEATHER TANKAGE 11-0-0	Total Nitrogen	11.00	13.60 %
		Avail Phosphate	0.00	0.00 %
		Soluble Potash	0.00	0.00 %
		Arsenic	0.00	<41.00 ppm
		Cadmium	0.00	<20.00 ppm
		Lead	0.00	<20.00 ppm

CENEX/LAND O'LAKES
5500 CENEX DR, P O BOX 64089
INVER GROVE HEIGHTS, MN 55076

LAB NO	PRODUCT	ANALYTEDES	CLAIM	FOUND
00001352	28-0-0	Total Nitrogen	28.00	28.50 %
		Avail Phosphate	0.00	0.00 %
		Soluble Potash	0.00	0.00 %
		Arsenic	0.00	<41.00 ppm
		Cadmium	0.00	<20.00 ppm

Fertilizer Heavy Metal Analysis

CENEX/LAND O'LAKES (cont.)

		Lead	0.00	<20.00 ppm
00001353	10-34-0	Total Nitrogen	10.00	10.00 %
		Avail Phosphate	34.00	33.40 %
		Soluble Potash	0.00	0.00 %
		Arsenic	0.00	<41.00 ppm
		Cadmium	0.00	<20.00 ppm
		Lead	0.00	<20.00 ppm
00001354	10-34-0	Total Nitrogen	10.00	9.98 %
		Avail Phosphate	34.00	33.10 %
		Soluble Potash	0.00	0.00 %
		Arsenic	0.00	<41.00 ppm
		Cadmium	0.00	<20.00 ppm
		Lead	0.00	<20.00 ppm
00001361	AMMONIUM SULFATE 19-5-0-22S	Total Nitrogen	19.00	21.50 %
		Avail Phosphate	5.00	0.24 %
		Soluble Potash	0.00	0.00 %
		Sulfur	22.00	22.80 %
		Arsenic	0.00	<41.00 ppm
		Cadmium	0.00	<20.00 ppm
		Lead	0.00	<20.00 ppm

CENTRAL AG SERVICES 209 BRIDGE ST N, P O BOX 98 CLARISSA, MN 56440-0098

LAB NO	PRODUCT	ANALYTEDES	CLAIM	FOUND
00001364	0-0-60	Total Nitrogen	0.00	0.00 %
		Avail Phosphate	0.00	0.00 %
		Soluble Potash	60.00	60.30 %
		Arsenic	0.00	<41.00 ppm
		Cadmium	0.00	<20.00 ppm
		Lead	0.00	<20.00 ppm
00001365	18-46-0	Total Nitrogen	18.00	17.00 %
		Avail Phosphate	46.00	45.60 %
		Soluble Potash	0.00	0.00 %
		Arsenic	0.00	<41.00 ppm
		Cadmium	0.00	<20.00 ppm
		Lead	0.00	<20.00 ppm
00001406	0-0-60	Total Nitrogen	0.00	0.00 %
		Avail Phosphate	0.00	0.00 %
		Soluble Potash	60.00	59.80 %
		Arsenic	0.00	<1.00 ppm
		Cadmium	0.00	<20.00 ppm
		Lead	0.00	<20.00 ppm

CENTRAL AG SERVICES (cont.)

00001407	18-46-0	Total Nitrogen	18.00	17.30 %
		Avail Phosphate	46.00	46.20 %
		Soluble Potash	0.00	0.00 %
		Arsenic	0.00	2.50 ppm
		Cadmium	0.00	<20.00 ppm
		Lead	0.00	<20.00 ppm

Fertilizer Heavy Metal Analysis

COZINCO SALES INC
P O BOX 27363
DENVER, CO 80227

LAB NO	PRODUCT	ANALYTEDES	CLAIM	FOUND
00001324	ZINC SULFATE 35.5% ZINC	Total Nitrogen	0.00	0.00 %
		Avail Phosphate	0.00	0.00 %
		Soluble Potash	0.00	0.00 %
		Zinc	35.50	33.40 %
		Arsenic	0.00	<41.00 ppm
		Cadmium	0.00	<20.00 ppm
00002592	ZINC SULFATE MONOHYDRATE ZN 35.5%	Lead	0.00	39.00 ppm
		Zinc	35.50	32.50 %
		Arsenic	0.00	<2.00 ppm
		Cadmium	0.00	18.00 ppm
		Lead	0.00	98.00 ppm
00002601	ZINC 35.5% ZN	Mercury	0.00	<0.50 ppm
		Zinc	35.50	35.80 %
		Arsenic	0.00	<2.00 ppm
		Cadmium	0.00	22.00 ppm
		Lead	0.00	56.00 ppm
		Mercury	0.00	<0.50 ppm

COZINO SALES
7400 W JEFFERSON AVE
DENVER, CO 80235

LAB NO	PRODUCT	ANALYTEDES	CLAIM	FOUND
00001429	GRANULAR ZINC 35.5% ZN	Total Nitrogen	0.00	0.00 %
		Avail Phosphate	0.00	0.00 %
		Soluble Potash	0.00	0.00 %
		Zinc	35.50	33.50 %
		Arsenic	0.00	<1.00 ppm
		Cadmium	0.00	50.00 ppm
		Lead	0.00	161.00 ppm

CROP PRODUCTION SERVICES INC
725 MAIN ST E, P O BOX 289
PERHAM, MN 56573

LAB NO	PRODUCT	ANALYTEDES	CLAIM	FOUND
00001369	21-0-0-24S	Total Nitrogen	21.00	21.40 %
		Avail Phosphate	0.00	0.00 %
		Soluble Potash	0.00	0.00 %
		Sulfur	24.00	23.40 %
		Arsenic	0.00	<41.00 ppm
		Cadmium	0.00	<20.00 ppm
		Lead	0.00	<20.00 ppm
00001408	21-0-0 24 S	Total Nitrogen	21.00	21.10 %
		Avail Phosphate	0.00	0.00 %
		Soluble Potash	0.00	0.00 %
		Sulfur	24.00	22.80 %
		Arsenic	0.00	<1.00 ppm
		Cadmium	0.00	<20.00 ppm
		Lead	0.00	<20.00 ppm

Fertilizer Heavy Metal Analysis

CROP PRODUCTION SERVICES INC (cont.)

00001409	46-0-0	Total Nitrogen	46.00	46.70 %
		Avail Phosphate	0.00	0.00 %
		Soluble Potash	0.00	0.00 %
		Arsenic	0.00	<1.00 ppm
		Cadmium	0.00	<20.00 ppm
		Lead	0.00	<20.00 ppm

CROPMATE CO THE DBA CONAGRA FERTILIZER CO 7632 CNTY 101 SHAKOPEE, MN 55379

LAB NO	PRODUCT	ANALYTEDES	CLAIM	FOUND
00001339	POTASSIUM CHLORIDE 0-0-60	Total Nitrogen	0.00	0.00 %
		Avail Phosphate	0.00	0.00 %
		Soluble Potash	60.00	60.90 %
		Arsenic	0.00	<41.00 ppm
		Cadmium	0.00	<20.00 ppm
		Lead	0.00	<20.00 ppm

DEXOL INDUSTRIES 1450 228TH ST W TORRANCE, CA 90501

LAB NO	PRODUCT	ANALYTEDES	CLAIM	FOUND
00001423	DEXOL LIQUID IRON 4-0-0	Total Nitrogen	4.00	4.39 %
		Avail Phosphate	0.00	0.00 %
		Soluble Potash	0.00	0.00 %
		Iron	1.00	1.10 %
		Arsenic	0.00	<1.00 ppm
		Cadmium	0.00	<20.00 ppm
		Lead	0.00	<20.00 ppm

DOMICILIO CONOCIDO 92018 TAMOS PANNCO VERA CRUZ, MX

LAB NO	PRODUCT	ANALYTEDES	CLAIM	FOUND
00002573	TECMANGAN BRAND MANGANESE SULFATE	Manganese	29.50	31.05 %
		Arsenic	0.00	<2.00 ppm
		Cadmium	0.00	<2.00 ppm
		Lead	0.00	<2.00 ppm
		Mercury	0.00	<0.50 ppm

DRAGON CHEMICAL CORP 7033 WALROND DR NW ROANOKE, VA 24019

LAB NO	PRODUCT	ANALYTEDES	CLAIM	FOUND
00003277	DRAGON IRON SULPHATE	Total Nitrogen	0.00	0.00 %
		Iron	20.00	18.80 %
		Arsenic	0.00	3.00 ppm
		Cadmium	0.00	<4.00 ppm
		Lead	0.00	<20.00 ppm
		Mercury	0.00	<0.50 ppm

Fertilizer Heavy Metal Analysis

EARTH SOILS
RTE 2 BOX 74
ELLENDALE, MN 56026

LAB NO	PRODUCT	ANALYTEDES	CLAIM	FOUND
00001382	46-0-0	Total Nitrogen	46.00	46.40 %
		Avail Phosphate	0.00	0.00 %
		Soluble Potash	0.00	0.00 %
		Arsenic	0.00	<41.00 ppm
		Cadmium	0.00	<20.00 ppm
		Lead	0.00	<20.00 ppm

EKLUNDS AG SERVICES INC
29836 JACKSON ST NE, P O BOX 88
ISANTI, MN 55040

LAB NO	PRODUCT	ANALYTEDES	CLAIM	FOUND
00001363	34-0-0	Total Nitrogen	34.00	32.10 %
		Avail Phosphate	0.00	0.00 %
		Soluble Potash	0.00	0.00 %
		Arsenic	0.00	<41.00 ppm
		Cadmium	0.00	<20.00 ppm
		Lead	0.00	<20.00 ppm

FARMERS COOP GRAIN&SEED ASSN/CNTRY
8TH ST & DAVIS AVE, BOX 525
THIEF RIVER FALLS, MN 56701

LAB NO	PRODUCT	ANALYTEDES	CLAIM	FOUND
00001371	46-0-0	Total Nitrogen	46.00	46.30 %
		Avail Phosphate	0.00	0.00 %
		Soluble Potash	0.00	0.00 %
		Arsenic	0.00	<41.00 ppm
		Cadmium	0.00	<20.00 ppm
		Lead	0.00	<20.00 ppm

FARMERS MILL & ELEVATOR INC
27920 DANVILLE AVE, P O BOX 488
CASTLE ROCK, MN 55010

LAB NO	PRODUCT	ANALYTEDES	CLAIM	FOUND
00001966	21-0-0 24S	Total Nitrogen	21.00	21.00 %
		Avail Phosphate	0.00	0.00 %
		Soluble Potash	0.00	0.00 %
		Sulfur	24.00	22.50 %
		Arsenic	0.00	3.70 ppm
		Cadmium	0.00	<20.00 ppm
		Lead	0.00	<20.00 ppm

FRANKS NURSERY & CRAFTS INC
6501 NEVADA E, BOX 6317
DETROIT, MI 48234

LAB NO	PRODUCT	ANALYTEDES	CLAIM	FOUND
00002658	FRANK'S LAWN FOOD 32-4-8	Total Nitrogen	32.00	32.20 %
		Avail Phosphate	4.00	4.11 %
		Soluble Potash	8.00	8.95 %
		Arsenic	0.00	<2.00 ppm
		Cadmium	0.00	<2.00 ppm

Fertilizer Heavy Metal Analysis

FRANKS NURSERY & CRAFTS INC (cont.)

		Lead	0.00	<2.00 ppm
		Mercury	0.00	<0.50 ppm

FRIT INDUSTRIES INC BOX 1589 OZARK, AL 36361-1589

LAB NO	PRODUCT	ANALYTE/DES	CLAIM	FOUND
00001337	FRIT MICRONUTRIENT FERTILIZER 40% FE	Total Nitrogen	0.00	0.00 %
		Avail Phosphate	0.00	0.00 %
		Soluble Potash	0.00	0.00 %
		Iron	40.00	37.50 %
		Arsenic	0.00	<41.00 ppm
		Cadmium	0.00	29.00 ppm
		Lead	0.00	1160.00 ppm
00001338	FRIT MICRONUTRIENT FERTILIZER 10% FE	Total Nitrogen	0.00	0.00 %
		Avail Phosphate	0.00	0.00 %
		Soluble Potash	0.00	0.00 %
		Iron	10.00	9.80 %
		Copper	5.00	2.70 %
		Arsenic	0.00	<41.00 ppm
		Cadmium	0.00	65.00 ppm
		Lead	0.00	2270.00 ppm
00001355	MICRO NUTRIENT FERTILIZER 50% FE	Total Nitrogen	0.00	0.00 %
		Avail Phosphate	0.00	0.00 %
		Soluble Potash	0.00	0.00 %
		Iron	50.00	45.40 %
		Arsenic	0.00	<41.00 ppm
		Cadmium	0.00	<20.00 ppm
		Lead	0.00	589.00 ppm
00001358	MICRO NUTRIENT FERTILIZER 36% (MG)	Total Nitrogen	0.00	0.00 %
		Avail Phosphate	0.00	0.00 %
		Soluble Potash	0.00	0.00 %
		Magnesium	36.00	30.80 %
		Arsenic	0.00	<41.00 ppm
		Cadmium	0.00	<20.00 ppm
		Lead	0.00	24.00 ppm
00001375	36% ZINC	Total Nitrogen	0.00	0.00 %
		Avail Phosphate	0.00	0.00 %
		Soluble Potash	0.00	0.00 %
		Zinc	36.00	35.10 %
		Arsenic	0.00	<41.00 ppm
		Cadmium	0.00	126.00 ppm
		Lead	0.00	11600 ppm
00001430	ZINC 36%	Total Nitrogen	0.00	0.00 %
		Avail Phosphate	0.00	0.00 %
		Soluble Potash	0.00	0.00 %
		Zinc	36.00	34.40 %
		Arsenic	0.00	17.00 ppm
		Cadmium	0.00	192.00 ppm

Fertilizer Heavy Metal Analysis

FRIT INDUSTRIES INC (cont.)

00001435	MICRONUTRIENT FERTILIZER 50% FE	Lead	0.00	9350.00 ppm
		Total Nitrogen	0.00	0.00 %
		Avail Phosphate	0.00	0.00 %
		Soluble Potash	0.00	0.00 %
		Iron	50.00	45.60 %
		Arsenic	0.00	14.8 ppm
		Cadmium	0.00	<20.00 ppm
00001439	F-305 G MICRONUTRIENT FERTILIZER	Lead	0.00	462.00 ppm
		Total Nitrogen	0.00	0.00 %
		Avail Phosphate	0.00	0.00 %
		Soluble Potash	0.00	0.00 %
		Manganese	6.00	9.20 %
		Zinc	20.00	19.40 %
		Arsenic	0.00	28.00 ppm
00002572	FRIT MICRONUTRIENT FERTILIZER CORN MIX	Cadmium	0.00	194.00 ppm
		Lead	0.00	682.00 ppm
		Boron	2.00	1.88 %
		Copper	2.00	2.60 %
		Iron	8.00	10.90 %
		Zinc	20.00	17.30 %
		Arsenic	0.00	45.00 ppm
00002591	FRIT ZINC OXY-SULFATE 36% ZN	Cadmium	0.00	26.00 ppm
		Lead	0.00	2160.0 ppm
		Mercury	0.00	12.00 ppm
		Zinc	36.00	27.50 %
		Arsenic	0.00	43.00 ppm
		Cadmium	0.00	63.00 ppm
		Lead	0.00	3565.0 ppm
		Mercury	0.00	3.17 ppm

GLORIOUS GARDENS INC P O BOX 3628 DES MOINES, IA 50322

LAB NO	PRODUCT	ANALYTEDES	CLAIM	FOUND
00002659	GLORIOUS GARDENS ROCK PHOS. 0-3-0	Total Nitrogen	0.00	0.00 %
		Avail Phosphate	3.00	1.94 %
		Soluble Potash	0.00	0.30 %
		Arsenic	0.00	5.00 ppm
		Cadmium	0.00	108.00 ppm
		Lead	0.00	16.00 ppm
		Mercury	0.00	<0.50 ppm
00002660	GLORIOUS GARDENS IRON SULFATE 18%	Sulfur	18.00	19.41 %
		Iron	30.00	30.90 %
		Arsenic	0.00	<2.00 ppm
		Cadmium	0.00	<2.00 ppm
		Lead	0.00	<2.00 ppm
		Mercury	0.00	<0.50 ppm

Fertilizer Heavy Metal Analysis

GLORIOUS GARDENS INC (cont.)

00003267	GLORIOUS GARDENS ROCK PHOSPHATE	Total Nitrogen	0.00	0.00 %
		Avail Phosphate	46.00	46.40 %
		Soluble Potash	0.00	0.00 %
		Arsenic	0.00	4.10 ppm
		Cadmium	0.00	6.00 ppm
		Lead	0.00	<20.00 ppm
		Mercury	0.00	<0.50 ppm
00003276	GLORIOUS GARDENS MAGNESIUM SULFATE	Total Nitrogen	0.00	0.00 %
		Magnesium	16.00	<0.10 %
		Sulfur	22.00	15.20 %
		Arsenic	0.00	<2.00 ppm
		Cadmium	0.00	<4.00 ppm
		Lead	0.00	<20.00 ppm
		Mercury	0.00	<0.50 ppm

**GRIFFIN LLC
P O BOX 1847
VALDOSTA, GA 31603-1847**

LAB NO	PRODUCT	ANALYTEDES	CLAIM	FOUND
00001329	TENNESSEE BRAND COPPER SULFATE	Total Nitrogen	0.00	0.00 %
		Avail Phosphate	0.00	0.00 %
		Soluble Potash	0.00	0.00 %
		Copper	25.20	25.90 %
		Arsenic	0.00	<41.00 ppm
		Cadmium	0.00	<20.00 ppm
		Lead	0.00	<20.00 ppm
00001436	COPPER SULFATE CRYSTALS 25.2% CU	Total Nitrogen	0.00	0.00 %
		Avail Phosphate	0.00	0.00 %
		Soluble Potash	0.00	0.00 %
		Copper	25.20	24.90 %
		Arsenic	0.00	<1.00 ppm
		Cadmium	0.00	<20.00 ppm
		Lead	0.00	<20.00 ppm
00001437	TENNESSEE BRAND COPPER SULFATE 25.2% CU	Total Nitrogen	0.00	0.00 %
		Avail Phosphate	0.00	0.00 %
		Soluble Potash	0.00	0.00 %
		Copper	25.20	24.90 %
		Arsenic	0.00	<1.00 ppm
		Cadmium	0.00	<20.00 ppm
		Lead	0.00	<20.00 ppm

**GROWING MARKETS INC
1533 LINDEN ST
DES MOINES, IA 50309**

LAB NO	PRODUCT	ANALYTEDES	CLAIM	FOUND
00001705	GLORIOUS GARDENS ROCK PHOSPHATE 0-3-0	Total Nitrogen	0.00	0.00 %
		Avail Phosphate	3.00	1.82 %

Fertilizer Heavy Metal Analysis

GROWING MARKETS INC. (cont.)

		Soluble Potash	0.00	0.00 %
		Arsenic	0.00	8.00 ppm
		Cadmium	0.00	106.00 ppm
		Lead	0.00	<20.00 ppm

I M C GLOBAL OPERATIONS INC 2345 WAUKEGAN RD STE E200 BANNOCKBURN, IL 60015-1580

LAB NO	PRODUCT	ANALYTEDES	CLAIM	FOUND
00001336	SUL-PO-MAG 0-0-22	Total Nitrogen	0.00	0.00 %
		Avail Phosphate	0.00	0.00 %
		Soluble Potash	22.00	22.30 %
		Magnesium	10.80	11.50 %
		Sulfur	22.00	21.60 %
		Arsenic	0.00	<41.00 ppm
		Cadmium	0.00	<20.00 ppm
		Lead	0.00	<20.00 ppm

I M C VIGORO P O BOX 540 SYLACAUGA, AL 35150

LAB NO	PRODUCT	ANALYTEDES	CLAIM	FOUND
00002584	PREMIUM LAWN FERTILIZER 27-2-5	Total Nitrogen	27.00	32.50 %
		Iron	2.00	0.85 %
		Controll. S- Rel Nitr	10.00	9.63 %
		Arsenic	0.00	2.00 ppm
		Cadmium	0.00	<2.00 ppm
		Lead	0.00	3.00 ppm
		Mercury	0.00	<0.50 ppm
00001351	VIGORO PERK DRY NUTRITIONAL	Total Nitrogen	0.00	0.00 %
		Avail Phosphate	0.00	0.00 %
		Soluble Potash	0.00	0.00 %
		Sulfur	5.00	7.20 %
		Iron	15.00	15.00 %
		Arsenic	0.00	<41.00 ppm
		Cadmium	0.00	<20.00 ppm
		Lead	0.00	303.00 ppm
00001922	PERK DRY NUTRITIONAL 0-0-0	Sulfur	5.00	10.50 %
		Iron	15.00	13.70 %
		Zinc	2.70	3.02 %
		Arsenic	0.00	23.9 ppm
		Cadmium	0.00	<20.00 ppm
		Lead	0.00	198.00 ppm

INDUSTRIAS SULFAMEX S A DE CU 92018 TAMOS PANUCO VERA CRUS, MX

LAB NO	PRODUCT	ANALYTEDES	CLAIM	FOUND
00002793	TECMANGAM	Total Nitrogen	0.00	0.00 %
		Manganese	29.50	29.00 %

Fertilizer Heavy Metal Analysis

INDUSTRIAS SULFAMEX S A DE CU (cont.)

		Arsenic	0.00	<2.00 ppm
		Cadmium	0.00	<4.00 ppm
		Lead	0.00	<20.00 ppm
		Mercury	0.00	<0.50 ppm

IRONITE PRODUCTS CO 8700 VIA DE VENTURA, STE 280 SCOTTSDALE, AZ 85258

LAB NO	PRODUCT	ANALYTEDES	CLAIM	FOUND
00001340	IRONITE 1-0-0	Total Nitrogen	1.00	2.29 %
		Avail Phosphate	0.00	0.00 %
		Soluble Potash	0.00	0.00 %
		Sulfur	5.00	8.50 %
		Iron	4.50	10.90 %
		Arsenic	0.00	3540.00 ppm
		Cadmium	0.00	<20.00 ppm
		Lead	0.00	2360.00 ppm
00001347	IRONITE 1-0-0	Total Nitrogen	1.00	2.20 %
		Avail Phosphate	0.00	0.00 %
		Soluble Potash	0.00	0.00 %
		Sulfur	5.00	8.80 %
		Iron	4.50	11.00 %
		Arsenic	0.00	3600.00 ppm
		Cadmium	0.00	<20.00 ppm
		Lead	0.00	3400.00 ppm
00001706	IRONITE PRO-FORMULA2 2-0-0	Total Nitrogen	2.00	2.50 %
		Avail Phosphate	0.00	0.00 %
		Soluble Potash	0.00	0.00 %
		Sulfur	4.50	5.50 %
		Iron	4.25	11.30 %
		Arsenic	0.00	6190.00 ppm
		Cadmium	0.00	28.9 ppm
		Lead	0.00	2650.00 ppm
00001920	IRONITE 1-0-0	Total Nitrogen	1.00	1.91 %
		Avail Phosphate	0.00	0.00 %
		Soluble Potash	0.00	0.00 %
		Sulfur	5.00	12.10 %
		Iron	4.50	11.00 %
		Arsenic	0.00	6020.00 ppm
		Cadmium	0.00	28.00 ppm
		Lead	0.00	2410.00 ppm
00002583	IRONITE 1-0-0	Total Nitrogen	1.00	2.11 %
		Sulfur	5.00	13.54 %
		Iron	4.50	11.30 %
		Arsenic	0.00	4840.00 ppm
		Cadmium	0.00	22.00 ppm
		Lead	0.00	3175.00 ppm
		Mercury	0.00	10.30 ppm
00002719	IRONITE1-0-0	Total Nitrogen	1.00	2.34 %
		Sulfur	5.00	13.40 %
		Iron	4.50	12.01 %
		Arsenic	0.00	3410.00 ppm
		Cadmium	0.00	32.30 ppm

Fertilizer Heavy Metal Analysis

IRONITE PRODUCTS CO (cont.)

		Lead	0.00	3940.00 ppm
		Mercury	0.00	24.50 ppm
00003268	IRONITE 1-0-0	Total Nitrogen	1.00	2.04 %
		Iron	4.50	11.40 %
		Sulfur	5.00	12.40 %
		Arsenic	0.00	4410.0 ppm
		Cadmium	0.00	28.70 ppm
		Lead	0.00	2420.0 ppm
		Mercury	0.00	13.30 ppm
00003273	IRONITE 1-0-0	Total Nitrogen	0.00	0.00 %
		Iron	4.50	10.80 %
		Sulfur	5.00	13.50 %
		Arsenic	0.00	3670.0 ppm
		Cadmium	0.00	30.70 ppm
		Lead	0.00	1890.0 ppm
		Mercury	0.00	10.50 ppm

JOHNSON
38339 532ND AVE
PAYNESVILLE, MN 56362

LAB NO	PRODUCT	ANALYTEDES	CLAIM	FOUND
00002667	NUTRI CARB	Arsenic	0.00	14.00 ppm
		Cadmium	0.00	<2.00 ppm
		Lead	0.00	13.00 ppm
		Mercury	0.00	<0.50 ppm

LEAF RIVER AG SERVICE
HWY 10 E, P O BOX 280
NEW YORK MILLS, MN 56567

LAB NO	PRODUCT	ANALYTEDES	CLAIM	FOUND
00001367	0-0-22-22S	Total Nitrogen	0.00	0.00 %
		Avail Phosphate	0.00	0.00 %
		Soluble Potash	22.00	22.10%
		Sulfur	22.00	22.10 %
		Arsenic	0.00	<41.00 ppm
		Cadmium	0.00	<20.00 ppm
		Lead	0.00	<20.00 ppm
00001647	0-0-60	Total Nitrogen	0.00	0.00 %
		Avail Phosphate	0.00	0.00 %
		Soluble Potash	60.00	60.90 %
		Arsenic	0.00	14.4 ppm
		Cadmium	0.00	<20.00 ppm
		Lead	0.00	<20.00 ppm

LESCO INC
20005 LAKE RD
ROCKY RIVER, OH 44116-1545

LAB NO	PRODUCT	ANALYTEDES	CLAIM	FOUND
00002585	LESCO PROFESSIONAL TURF FERT 32-5-7	Total Nitrogen	32.00	33.10 %
		Sulfur	2.60	2.95 %
		Controll. S- Rel Nitr	7.20	7.36 %

Fertilizer Heavy Metal Analysis

LESCO INC (cont.)

		Arsenic	0.00	<2.00 ppm
		Cadmium	0.00	<2.00 ppm
		Lead	0.00	<2.00 ppm
		Mercury	0.00	<0.50 ppm

**MAGNAGRO INTERNATIONAL INC
BOX 261
LAWRENCE, KS 66044**

LAB NO	PRODUCT	ANALYTEDES	CLAIM	FOUND
00001970	NATURAL SOURCE 19-0-0	Total Nitrogen	19.00	19.50 %
		Avail Phosphate	0.00	0.00 %
		Soluble Potash	0.00	0.00 %
		Arsenic	0.00	1.60 ppm
		Cadmium	0.00	<20.00 ppm
		Lead	0.00	<20.00 ppm

**MARTIN MARIETTA AGGREGATES
P O BOX 550
IOWA FALLS, IA 50126**

LAB NO	PRODUCT	ANALYTEDES	CLAIM	FOUND
00001376	CROP MAG 58% MAGNESIUM	Total Nitrogen	0.00	0.00 %
		Avail Phosphate	0.00	0.00 %
		Soluble Potash	0.00	0.00 %
		Magnesium	58.00	58.10 %
		Arsenic	0.00	<41.00 ppm
		Cadmium	0.00	<20.00 ppm
		Lead	0.00	<20.00 ppm

**MARTIN RESOURCES
14001 WEST MUPHY
ODESSA, TX 79763**

LAB NO	PRODUCT	ANALYTEDES	CLAIM	FOUND
00001362	WATER DEGRADABLE SULFUR 90% (S)	Total Nitrogen	0.00	0.00 %
		Avail Phosphate	0.00	0.00 %
		Soluble Potash	0.00	0.00 %
		Sulfur	90.00	87.50 %
		Arsenic	0.00	<41.00 ppm
		Cadmium	0.00	<20.00 ppm
		Lead	0.00	<20.00 ppm

**MILORGANITE DIVISION - MMSD
P O BOX 3049
MILWAUKEE, WI 53201-3049**

LAB NO	PRODUCT	ANALYTEDES	CLAIM	FOUND
00001342	MILORGANITE 6-2-0	Total Nitrogen	6.00	6.48 %
		Avail Phosphate	2.00	3.33 %
		Soluble Potash	0.00	0.00 %
		Iron	4.00	5.30 %
		Arsenic	0.00	<41.00 ppm
		Cadmium	0.00	<20.00 ppm
		Lead	0.00	54.00 ppm

Fertilizer Heavy Metal Analysis

**MINNESOTA BIO-AG
402 FRONT ST E
WYKOFF, MN 55990**

LAB_NO	PRODUCT	ANALYTEDES	CLAIM	FOUND
00001768	8-10-0	Total Nitrogen	8.00	8.21 %
		Avail Phosphate	10.00	16.00 %
		Soluble Potash	0.00	1.05 %
		Arsenic	0.00	8.20 ppm
		Cadmium	0.00	<20.00 ppm
		Lead	0.00	71.20 ppm

**MONTANA SULPHUR & CHEMICAL CO
627 EXXON REFINERY RD, P O BOX 31118
BILLINGS, MT 59107-1118**

LAB_NO	PRODUCT	ANALYTEDES	CLAIM	FOUND
00001326	YELLOWSTONE SULFUR 90% SULFUR	Total Nitrogen	0.00	0.00 %
		Avail Phosphate	0.00	0.00 %
		Soluble Potash	0.00	0.00 %
		Sulfur	90.00	87.90 %
		Arsenic	0.00	<41.00 ppm
		Cadmium	0.00	<20.00 ppm
		Lead	0.00	<20.00 ppm

**ORGANIC CONVERSION CORP
19734 COATES BLVD
HASTINGS, MN 55033**

LAB_NO	PRODUCT	ANALYTEDES	CLAIM	FOUND
00001346	SOIL AID COW MANURE .5-.5-.5	Total Nitrogen	0.50	0.80 %
		Avail Phosphate	0.50	1.14 %
		Soluble Potash	0.50	0.44 %
		Arsenic	0.00	<41.00 ppm
		Cadmium	0.00	<20.00 ppm
		Lead	0.00	<20.00 ppm

**P B I GORDON CORP
1217 12TH ST W, P O BOX 014090
KANSAS CITY, MO 64101-0090**

LAB_NO	PRODUCT	ANALYTEDES	CLAIM	FOUND
00001921	ACME MIRACLE GREEN LIQUID IRON 0-0-0	Total Nitrogen	0.00	0.00 %
		Avail Phosphate	0.00	0.00 %
		Soluble Potash	0.00	0.00 %
		Iron	6.00	7.20 %
		Arsenic	0.00	2.70 ppm
		Cadmium	0.00	<20.00 ppm
		Lead	0.00	<20.00 ppm

**PERHAM COOP CREAMERY ASSN
459 3RD AVE SE, P O BOX 247
PERHAM, MN 56573**

LAB_NO	PRODUCT	ANALYTEDES	CLAIM	FOUND
00001368	21-0-0-24S	Total Nitrogen	21.00	21.30 %
		Avail Phosphate	0.00	0.00 %

Fertilizer Heavy Metal Analysis

PERHAM COOP CREAMERY ASSN (cont.)

		Soluble Potash	0.00	0.00 %
		Sulfur	24.00	23.10 %
		Arsenic	0.00	<41.00 ppm
		Cadmium	0.00	<20.00 ppm
		Lead	0.00	<20.00 ppm

**PESTELL MINERALS & INGREDIENTS
141 HAMILTON RD, P O BOX 794
NEW HAMBURG ONTARIO, CN NOB 2G0**

LAB NO	PRODUCT	ANALYTEDES	CLAIM	FOUND
00002575	COPPER SULFATE 25.2% CU	Copper	25.20	24.70 %
		Arsenic	0.00	3.00 ppm
		Cadmium	0.00	<2.00 ppm
		Lead	0.00	12.00 ppm
		Mercury	0.00	<0.50 ppm

**PHELPS DODGE REFINING CORP
P O BOX 20001
EL PASO, TX 79998**

LAB NO	PRODUCT	ANALYTEDES	CLAIM	FOUND
00001360	COPPER SULFATE CRYSTAL 25.2% (CU)	Total Nitrogen	0.00	0.00 %
		Avail Phosphate	0.00	0.00 %
		Soluble Potash	0.00	0.00 %
		Copper	25.20	25.80 %
		Arsenic	0.00	<41.00 ppm
		Cadmium	0.00	<20.00 ppm
		Lead	0.00	<20.00 ppm

**PHIBRO-TECH INC
FORT LEE, NJ 07024**

LAB NO	PRODUCT	ANALYTEDES	CLAIM	FOUND
00001357	COPPER SULFATE 25.2% (CU)	Total Nitrogen	0.00	0.00 %
		Avail Phosphate	0.00	0.00 %
		Soluble Potash	0.00	0.00 %
		Copper	25.20	25.80 %
		Arsenic	0.00	<41.00 ppm
		Cadmium	0.00	<20.00 ppm
		Lead	0.00	<20.00 ppm

**PRO AG FARMERS COOP
104 FRONT ST E, P O BOX 38
BRANDON, MN 56315**

LAB NO	PRODUCT	ANALYTEDES	CLAIM	FOUND
00001370	46-0-0	Total Nitrogen	46.00	46.20 %
		Avail Phosphate	0.00	0.00 %
		Soluble Potash	0.00	0.00 %
		Arsenic	0.00	<41.00 ppm
		Cadmium	0.00	<20.00 ppm
		Lead	0.00	<20.00 ppm

Fertilizer Heavy Metal Analysis

**R S A MICROTECH
510 TRAIL E, BOX 940
DODGE CITY, KS 67801**

LAB NO	PRODUCT	ANALYTEDES	CLAIM	FOUND
00002598	RUFFIN-TUFF ZINC 10G	Total Nitrogen	0.00	0.00 %
		Avail Phosphate	0.00	0.00 %
		Soluble Potash	0.00	0.00 %
		Zinc	10.00	9.8 %
		Arsenic	0.00	<2.00 ppm
		Cadmium	0.00	<2.00 ppm
		Lead	0.00	7.00 ppm
00002763	RUFFIN TUFF ZINC 10G	Mercury	0.00	<0.50 ppm
		Total Nitrogen	0.00	0.00 %
		Zinc	10.00	9.45 %
		Arsenic	0.00	86.40 ppm
		Cadmium	0.00	<4.00 ppm
00002780	RUFFIN-TUFF	Lead	0.00	<20.00 ppm
		Mercury	0.00	0.93 ppm
		Total Nitrogen	0.00	0.00 %
		Sulfur	7.00	8.96 %
		Zinc	10.00	9.34 %
00002790	RUFFIN-TUFF ZINC 10-G	Arsenic	0.00	<2.00 ppm
		Cadmium	0.00	<4.00 ppm
		Lead	0.00	<20.00 ppm
		Mercury	0.00	1.68 ppm
		Total Nitrogen	0.00	0.00 %
00002791	RUFFIN-TUFF CROP MIX I	Sulfur	7.00	9.59 %
		Zinc	10.00	9.45 %
		Arsenic	0.00	<2.00 ppm
		Cadmium	0.00	<4.00 ppm
		Lead	0.00	<20.00 ppm
00002792	RUFFIN-TUFF CROP MIX II	Mercury	0.00	0.60 ppm
		Sulfur	8.00	10.07 %
		Manganese	4.00	3.34 %
		Zinc	5.00	5.88 %
		Arsenic	0.00	<2.00 ppm
00002600	COPPER 5G	Cadmium	0.00	<4.00 ppm
		Lead	0.00	<20.00 ppm
		Mercury	0.00	<0.50 ppm
		Sulfur	8.00	8.84 %
		Boron	1.50	1.57 %
00002600	COPPER 5G	Zinc	6.00	7.36 %
		Arsenic	0.00	4.20 ppm
		Cadmium	0.00	6.50 ppm
		Lead	0.00	<20.00 ppm
00002600	COPPER 5G	Mercury	0.00	<0.50 ppm

**R S A MICRTECH
510 TRAIL E, BOX 940
DODGE CITY, KS 67801**

LAB NO	PRODUCT	ANALYTEDES	CLAIM	FOUND
00002600	COPPER 5G	Sulfur	6.00	7.60 %
		Copper	5.00	4.50 %
		Arsenic	0.00	<2.00 ppm

Fertilizer Heavy Metal Analysis

R S A MICRTECH (cont.)

		Cadmium	0.00	<2.00 ppm
		Lead	0.00	15.00 ppm
		Mercury	0.00	<0.50 ppm

**ROYSTER CLARK INC
P O BOX 250
TARBORO, NC 27886**

LAB NO	PRODUCT	ANALYTEDES	CLAIM	FOUND
00001373	BORON 10%	Total Nitrogen	0.00	0.00 %
		Avail Phosphate	0.00	0.00 %
		Soluble Potash	0.00	0.00 %
		Boron	10.00	9.19 %
		Arsenic	0.00	<41.00 ppm
		Cadmium	0.00	<20.00 ppm
		Lead	0.00	<20.00 ppm

**SCOTTS CO
14111 SCOTTSLAWN RD
MARYSVILLE, OH 43041**

LAB NO	PRODUCT	ANALYTEDES	CLAIM	FOUND
00002656	SCOTTS SUPER TURF BUILDER 30-3-3	Total Nitrogen	30.00	30.60 %
		Avail Phosphate	3.00	3.22 %
		Soluble Potash	3.00	3.90 %
		Arsenic	0.00	<2.00 ppm
		Cadmium	0.00	<2.00 ppm
		Lead	0.00	<2.00 ppm
		Mercury	0.00	<0.50 ppm

**SCOTTS SIERRA HORTICULTURAL PROD CO
14111 SCOTTSLAWN RD
MARYSVILLE, OH 43041**

LAB NO	PRODUCT	ANALYTEDES	CLAIM	FOUND
00001350	ESMIGRAN MINOR ELEMENT	Sulfur	1.00	1.28 %
		Iron	2.00	2.70 %
		Zinc	1.00	1.40 %
		Arsenic	0.00	<41.00 ppm
		Cadmium	0.00	<20.00 ppm
		Lead	0.00	<20.00 ppm

**SIMS-AG PRODUCTS
3795 CNTY RD 29
MOUNT GILEAD, OH 43338**

LAB NO	PRODUCT	ANALYTEDES	CLAIM	FOUND
00001327	BIN BUSTERS MICROS 36% MAGNESIUM	Total Nitrogen	0.00	0.00 %
		Avail Phosphate	0.00	0.00 %
		Soluble Potash	0.00	0.00 %
		Magnesium	36.00	34.00 %
		Arsenic	0.00	<41.00 ppm
		Cadmium	0.00	<20.00 ppm
		Lead	0.00	84.00 ppm

Fertilizer Heavy Metal Analysis

SIMS-AG PRODUCTS (cont.)

00001438	VEGI-MAX MICRO MIX	Total Nitrogen	0.00	0.00 %
		Avail Phosphate	0.00	0.00 %
		Soluble Potash	0.00	0.00 %
		Sulfur	12.00	7.77 %
		Zinc	12.00	14.00 %
		Arsenic	0.00	63.00 ppm
		Cadmium	0.00	65.00 ppm
		Lead	0.00	1870.00 ppm
00002569	BINBUSTERS MICROS GRANULAR 50% FE	Iron	50.00	52.50 %
		Arsenic	0.00	5.00 ppm
		Cadmium	0.00	<2.00 ppm
		Lead	0.00	49.00 ppm
		Mercury	0.00	<0.50 ppm
00002570	BINBUSTERS MICROS 36% MG	Magnesium	36.00	33.20 %
		Arsenic	0.00	8.00 ppm
		Cadmium	0.00	2.00 ppm
		Lead	0.00	148.00 ppm
		Mercury	0.00	1.70 ppm
00002794	BIN BUSTER MICROS	Total Nitrogen	0.00	0.00 %
		Magnesium	36.00	35.00 %
		Arsenic	0.00	3.85 ppm
		Cadmium	0.00	<4.00 ppm
		Lead	0.00	83.00 ppm
		Mercury	0.00	<0.50 ppm
00002919	BIN BUSTER MICROS	Total Nitrogen	0.00	0.00 %
		Iron	50.00	55.00 %
		Arsenic	0.00	2.00 ppm
		Cadmium	0.00	<4.00 ppm
		Lead	0.00	<20.00 ppm
		Mercury	0.00	0.70 ppm

**SPECTRUM GROUP
8825 PAGE BLVD
SAINT LOUIS, MO 63114**

LAB NO	PRODUCT	ANALYTEDES	CLAIM	FOUND
00002582	PETERS HOUSE PLANT FOOD 15-30-15	Total Nitrogen	15.00	15.80 %
		Avail Phosphate	30.00	30.80 %
		Soluble Potash	15.00	15.60 %
		Arsenic	0.00	<2.00 ppm
		Cadmium	0.00	<2.00 ppm
		Lead	0.00	<2.00 ppm
		Mercury	0.00	<0.50 ppm

**TETRA MICRONUTRIENTS INC
P O BOX 73087
HOUSTON, TX 77273-3087**

LAB NO	PRODUCT	ANALYTEDES	CLAIM	FOUND
00002498	ZINK-GRO 35.5 ZN	Sulfur	17.50	16.59 %
		Zinc	35.50	32.9 %
		Arsenic	0.00	<2.00 ppm
		Cadmium	0.00	2.00 ppm

Fertilizer Heavy Metal Analysis

TETRA MICRONUTRIENTS INC (cont.)

		Lead	0.00	<2.00ppm
		Mercury	0.00	<0.5 ppm
00002571	MANGANESE SULFATE	Manganese	28.00	32.40 %
		Arsenic	0.00	<2.00 ppm
		Cadmium	0.00	<2.00 ppm
		Lead	0.00	<2.00 ppm
		Mercury	0.00	<0.50 ppm
00002764	ZINC SULFATE MONOHYDRATE	Total Nitrogen	0.00	0.00 %
		Sulfur	17.50	15.40 %
		Zinc	35.50	35.40 %
		Arsenic	0.00	<2.00 ppm
		Cadmium	0.00	12.35 ppm
		Lead	0.00	<20.00 ppm
		Mercury	0.00	<0.50 ppm
00002765	GRANULAR ZINC SULFATE MONOHYDRATE	Total Nitrogen	0.00	0.00 %
		Sulfur	17.50	15.60 %
		Zinc	35.50	33.40 %
		Arsenic	0.00	<2.00 ppm
		Cadmium	0.00	<4.00 ppm
		Lead	0.00	<20.00 ppm
		Mercury	0.00	<0.50 ppm
00002922	SUPER MAN-GRO	Total Nitrogen	0.00	0.00 %
		Manganese	32.00	29.20 %
		Sulfur	18.00	17.59 %
		Arsenic	0.00	4.90 ppm
		Cadmium	0.00	<4.00 ppm
		Lead	0.00	<20.00 ppm
		Mercury	0.00	<0.50 ppm

TETRA MICRONUTRIENTS INC WOODLANDS, TX 77380

LAB NO	PRODUCT	ANALYTEDES	CLAIM	FOUND
00002781	ZINK-GRO 35.5% ZN	Total Nitrogen	0.00	0.00 %
		Sulfur	17.50	16.40 %
		Zinc	35.50	32.00 %
		Arsenic	0.00	4.50 ppm
		Cadmium	0.00	143.00 ppm
		Lead	0.00	48.10 ppm
		Mercury	0.00	<0.50 ppm

TIGER INDUSTRIES 6444 42 ST SE CALGARY, AB. CANADA, CN T2C 2V1

LAB NO	PRODUCT	ANALYTEDES	CLAIM	FOUND
00001428	TIGER 90 SULFUR	Total Nitrogen	0.00	0.00 %
		Avail Phosphate	0.00	0.00 %
		Soluble Potash	0.00	0.00 %
		Sulfur	90.00	86.30 %
		Arsenic	0.00	1.40 ppm
		Cadmium	0.00	<20.00 ppm
		Lead	0.00	<20.00 ppm

Fertilizer Heavy Metal Analysis

TIGER INDUSTRIES (cont.)

00002653	TIGER 90% SULFUR	Sulfur	90.00	89.14 %
		Arsenic	0.00	<2.00 ppm
		Cadmium	0.00	<2.00 ppm
		Lead	0.00	3.00 ppm
		Mercury	0.00	<0.50 ppm

U S BORAX INC 26877 TOURNEY RD VALENCIA, CA 91355-1847

LAB NO	PRODUCT	ANALYTEDES	CLAIM	FOUND
00001325	GRANUBOR 14.3% BORON	Total Nitrogen	0.00	0.00 %
		Avail Phosphate	0.00	0.00 %
		Soluble Potash	0.00	0.00 %
		Boron	14.30	15.50 %
		Arsenic	0.00	<41.00 ppm
		Cadmium	0.00	<20.00 ppm
		Lead	0.00	<20.00 ppm
00001359	SOLUBOR 20.5% (B)	Total Nitrogen	0.00	0.00 %
		Avail Phosphate	0.00	0.00 %
		Soluble Potash	0.00	0.00 %
		Boron	20.50	19.50 %
		Arsenic	0.00	<41.00 ppm
		Cadmium	0.00	<20.00 ppm
		Lead	0.00	<20.00 ppm
00001377	FERTIBOR 14.9% BORON	Total Nitrogen	0.00	0.00 %
		Avail Phosphate	0.00	0.00 %
		Soluble Potash	0.00	0.00 %
		Boron	14.90	14.40 %
		Arsenic	0.00	<41.00 ppm
		Cadmium	0.00	<20.00 ppm
		Lead	0.00	<20.00 ppm

UAP NORTHERN PLAINS 801 BELTLINE RD SAUK CENTRE, MN 56378-1742

LAB NO	PRODUCT	ANALYTEDES	CLAIM	FOUND
00001372	0-46-0	Total Nitrogen	0.00	0.00 %
		Avail Phosphate	46.00	44.40 %
		Soluble Potash	0.00	0.00 %
		Arsenic	0.00	<41.00 ppm
		Cadmium	0.00	<20.00 ppm
		Lead	0.00	<20.00 ppm

VOLUNTARY PURCHASING GROUP INC HWY 82 W, P O BOX 460 BONHAM, TX 75418

LAB NO	PRODUCT	ANALYTEDES	CLAIM	FOUND
00001343	HI-YIELD GROWERS SPECIAL 12-6-6	Total Nitrogen	12.00	13.50 %
		Avail Phosphate	6.00	6.28 %
		Soluble Potash	6.00	6.26 %
		Arsenic	0.00	<41.00 ppm
		Cadmium	0.00	<20.00 ppm

Fertilizer Heavy Metal Analysis

VOLUNTARY PURCHASING GROUP INC (cont.)

		Lead	0.00	<20.00 ppm
00001344	HI-YEILD COPPERAS (IRON SULFATE)	Total Nitrogen	0.00	0.00 %
		Avail Phosphate	0.00	0.00 %
		Soluble Potash	0.00	0.00 %
		Sulfur	11.00	10.70 %
		Iron	19.00	17.70 %
		Arsenic	0.00	<41.00 ppm
		Cadmium	0.00	<20.00 ppm
		Lead	0.00	<20.00 ppm
00001345	HI-YIELD IONATE	Total Nitrogen	0.00	0.00 %
		Avail Phosphate	0.00	0.00 %
		Soluble Potash	0.00	0.00 %
		Sulfur	8.00	8.96 %
		Iron	10.00	11.10 %
		Arsenic	0.00	<41.00 ppm
		Cadmium	0.00	<20.00 ppm
		Lead	0.00	1040.00 ppm
00001348	HI-YIELD ALUMINUM SULFATE	Total Nitrogen	0.00	0.00 %
		Avail Phosphate	0.00	0.00 %
		Soluble Potash	0.00	0.00 %
		Sulfur	14.40	14.70 %
		Arsenic	0.00	<41.00 ppm
		Cadmium	0.00	<20.00 ppm
		Lead	0.00	<20.00 ppm
00001410	FERTILOME LIQUID IRON 3.25% FE	Total Nitrogen	0.00	0.00 %
		Avail Phosphate	0.00	0.00 %
		Soluble Potash	0.00	0.00 %
		Iron	3.25	3.30 %
		Arsenic	0.00	<1.00 ppm
		Cadmium	0.00	<20.00 ppm
		Lead	0.00	<20.00 ppm
00001918	HI-YIELD IONATE SOIL ACIDIFIER 0-0-0	Total Nitrogen	0.00	0.00 %
		Avail Phosphate	0.00	0.00 %
		Soluble Potash	0.00	0.00 %
		Sulfur	8.00	9.85 %
		Iron	10.00	14.40 %
		Arsenic	0.00	248.00 ppm
		Cadmium	0.00	<20.00 ppm
		Lead	0.00	886.00 ppm
00001919	HI-YIELD COPPERAS (IRON SULFATE) 0-0-0	Total Nitrogen	0.00	0.00 %
		Avail Phosphate	0.00	0.00 %
		Soluble Potash	0.00	0.00 %
		Sulfur	11.00	12.30 %
		Iron	19.00	21.70 %
		Arsenic	0.00	<1.00 ppm
		Cadmium	0.00	<20.00 ppm
		Lead	0.00	<20.00 ppm
00002628	NATURAL GUARD ROCK PHOS. 0-2-0	Total Nitrogen	0.00	0.00 %
		Avail Phosphate	2.00	8.62 %

Fertilizer Heavy Metal Analysis

VOLUNTARY PURCHASING GROUP INC (cont.)

		Soluble Potash	0.00	0.10 %
		Arsenic	0.00	7.40 ppm
		Cadmium	0.00	38.00 ppm
		Lead	0.00	4.00 ppm
		Mercury	0.00	<0.50 ppm
00002642	HI-YIELD IONATE SOIL ACIDIFIER	Sulfur	8.00	11.05 %
		Iron	10.00	11.20 %
		Arsenic	0.00	96.00 ppm
		Cadmium	0.00	3.00 ppm
		Lead	0.00	315.80 ppm
		Mercury	0.00	<0.50 ppm
00002643	FERTILOME NEW LAWN STARTER 9-13-7	Total Nitrogen	9.00	9.95 %
		Avail Phosphate	13.00	12.60 %
		Iron	0.10	2.00 %
		Arsenic	0.00	3.00 ppm
		Cadmium	0.00	4.00 ppm
		Lead	0.00	7.00 ppm
		Mercury	0.00	<0.50 ppm
00003271	HI-YIELD COPPERAS	Total Nitrogen	0.00	0.00 %
		Sulfur	11.00	11.80 %
		Iron	19.00	19.20 %
		Arsenic	0.00	2.30 ppm
		Cadmium	0.00	<4.00 ppm
		Lead	0.00	<20.00 ppm
		Mercury	0.00	<0.50 ppm
00003272	HI-YIELD ALUMINUM SULPHATE	Total Nitrogen	0.00	0.00 %
		Sulfur	14.00	15.80 %
		Arsenic	0.00	<2.00 ppm
		Cadmium	0.00	<4.00 ppm
		Lead	0.00	<20.00 ppm
		Mercury	0.00	<0.50 ppm
00003278	HI YIELD AMERICAN MAGNESIUM SULPHATE	Total Nitrogen	0.00	0.00 %
		Magnesium	9.50	9.15 %
		Sulfur	12.50	14.20 %
		Arsenic	0.00	<2.00 ppm
		Cadmium	0.00	<4.00 ppm
		Lead	0.00	<20.00 ppm
		Mercury	0.00	<0.50 ppm

**WESTERN CONSOLIDATED COOP
WYMAN AVE BOX 118
APPLETON, MN 56208**

LAB NO	PRODUCT	ANALYTEDES	CLAIM	FOUND
00001383	10-30-0	Total Nitrogen	10.00	10.50 %
		Avail Phosphate	30.00	29.60 %
		Soluble Potash	0.00	0.00 %
		Arsenic	0.00	<41.00 ppm
		Cadmium	0.00	<20.00 ppm
		Lead	0.00	<20.00 ppm
00001384	10-30-0	Total Nitrogen	10.00	10.60 %

Fertilizer Heavy Metal Analysis

WESTERN CONSOLIDATED COOP (cont.)

		Avail Phosphate	30.00	29.60 %
		Soluble Potash	0.00	0.00 %
		Arsenic	0.00	<41.00 ppm
		Cadmium	0.00	<20.00 ppm
		Lead	0.00	<20.00 ppm

**WHEATON DUMONT COOP ELEVATOR
HWY 75 BOX 97
DUMONT, MN 56236**

LAB NO	PRODUCT	ANALYTEDES	CLAIM	FOUND
00001366	11-52-0	Total Nitrogen	11.00	10.50 %
		Avail Phosphate	52.00	51.80 %
		Soluble Potash	0.00	0.00 %
		Arsenic	0.00	<41.00 ppm
		Cadmium	0.00	<20.00 ppm
		Lead	0.00	<20.00 ppm

**WILFARM LLC
5401 OAK TRAFFIC WAY N
GLADSTONE, MO 64118-4627**

LAB NO	PRODUCT	ANALYTEDES	CLAIM	FOUND
00001374	SPRAYABLE AMMONIUM SULFATE	Total Nitrogen	0.00	0.00 %
		Avail Phosphate	0.00	0.00 %
		Soluble Potash	0.00	0.00 %
		Arsenic	0.00	<41.00 ppm
		Cadmium	0.00	<20.00 ppm
		Lead	0.00	<20.00 ppm

**WINONA RIVER & RAIL INC
1000 3RD ST E
WINONA, MN 55987**

LAB NO	PRODUCT	ANALYTEDES	CLAIM	FOUND
00001330	SULFATE OF POTASH 0-0-50	Total Nitrogen	0.00	0.00 %
		Avail Phosphate	0.00	0.00 %
		Soluble Potash	50.00	49.70 %
		Sulfur	17.00	17.10 %
		Arsenic	0.00	<41.00 ppm
		Cadmium	0.00	<20.00 ppm
		Lead	0.00	<20.00 ppm
00001331	POTASSIUM CHLORIDE 0-0-62	Total Nitrogen	0.00	0.00 %
		Avail Phosphate	0.00	0.00 %
		Soluble Potash	62.00	62.10 %
		Arsenic	0.00	<41.00 ppm
		Cadmium	0.00	<20.00 ppm
		Lead	0.00	<20.00 ppm

2002-2005 Fertilizer Heavy Metal Analysis Summary

Minnesota Department of Agriculture, Agronomy and Plant Protection Division

A. H. Hoffman, Inc.
PO Box 290
Lancaster, NY 14086

AFZ-02-0008 Country Cottage Soil Acidifier Iron Sulfate (Fertilizer, Dry) sampled
05/23/2002

Analyte	Found	Claim
Sulfur (S)	11.5 %	11 %
Iron (Fe)	26.7 %	12 %
Arsenic (As)	4.15 ppm	
Cadmium (Cd)	1.98 ppm	
Lead (Pb)	392 ppm	
Total Mercury (Hg)	< 0.04 ppm	

AFZ-02-0023 Country Cottage Garden Fertilizer 5-10-5 (Fertilizer, Dry) sampled
04/16/2002

Analyte	Found	Claim
Total Nitrogen (N)	6.3 %	5.0 %
Available Phosphate (P ₂ O ₅)	15.4 %	10 %
Soluble Potash (K ₂ O)	7.03 %	5.0 %
Magnesium (Mg)	5.94 %	6.0 %
Sulfur (S)	0.92 %	1.0 %
Iron (Fe)	0.99 %	0.4 %
Arsenic (As)	2.64 ppm	
Cadmium (Cd)	1.39 ppm	
Lead (Pb)	9.23 ppm	
Total Mercury (Hg)	< 0.04 ppm	

2002-2005 Fertilizer Heavy Metal Analysis Summary

Minnesota Department of Agriculture, Agronomy and Plant Protection Division

Agri Business Technologies, Inc.
1102 Third Avenue
Albany, GA 31707

AFZ-02-0010

Agrinutrient Bean Mix (Fertilizer, Dry)

sampled
05/09/2002

Analyte	Found	Claim
Sulfur (S)	5.36 %	5.0 %
Boron (B)	0.73 %	1.0 %
Manganese (Mn)	15.3 %	20 %
Zinc (Zn)	8.1 %	5.0 %
Arsenic (As)	33.2 ppm	
Cadmium (Cd)	3.13 ppm	
Lead (Pb)	557 ppm	
Total Mercury (Hg)	0.276 ppm	

2002-2005 Fertilizer Heavy Metal Analysis Summary

Minnesota Department of Agriculture, Agronomy and Plant Protection Division

Bonide Products, Inc.
Two Wurz Avenue
Yorkville, NY 13495

AFZ-02-0006 Liquid Iron (Fertilizer, Liquid) sampled
04/23/2002

Analyte	Found	Claim
Iron (Fe)	4.79 %	5.0 %
Arsenic (As)	< 0.40 ppm	
Cadmium (Cd)	1.79 ppm	
Lead (Pb)	7.38 ppm	
Total Mercury (Hg)	< 0.04 ppm	

AFZ-02-0007 Iron Sulfate (Fertilizer, Dry) sampled
04/23/2002

Analyte	Found	Claim
Iron (Fe)	14.5 %	15 %
Arsenic (As)	8.87 ppm	
Cadmium (Cd)	1.10 ppm	
Lead (Pb)	219 ppm	
Total Mercury (Hg)	0.072 ppm	

AFZ-02-0014 Aluminum Sulfate (Fertilizer, Dry) sampled
04/24/2002

Analyte	Found	Claim
Sulfur (S)	13.4 %	15 %
Arsenic (As)	< 0.41 ppm	
Cadmium (Cd)	< 0.41 ppm	
Lead (Pb)	0.70 ppm	
Total Mercury (Hg)	< 0.04 ppm	

2002-2005 Fertilizer Heavy Metal Analysis Summary

Minnesota Department of Agriculture, Agronomy and Plant Protection Division

Cargill Fertilizer - Minneapolis
MS #19, PO Box 9300
Minneapolis, MN 55440-9300

AFZ-02-0027

Fibrominn Turkey Litter Ash (Fertilizer, Dry)

sampled
03/07/2002

Analyte	Found	Claim
Available Phosphate (P ₂ O ₅)	16.4 %	20 %
Soluble Potash (K ₂ O)	8.95 %	10 %
Sulfur (S)	0.92 %	1.0 %
Arsenic (As)	3.16 ppm	
Cadmium (Cd)	< 0.49 ppm	
Lead (Pb)	4.15 ppm	
Total Mercury (Hg)	< 0.04 ppm	

2002-2005 Fertilizer Heavy Metal Analysis Summary

Minnesota Department of Agriculture, Agronomy and Plant Protection Division

Chem One Corporation
8017 Pinemont Drive, Suite 100
Houston, TX 77040-6519

AFZ-02-0011

Copper Sulfate Crystals (Fertilizer, Dry)

sampled
05/01/2002

Analyte	Found	Claim
Copper (Cu)	24.6 %	25 %
Arsenic (As)	< 0.41 ppm	
Cadmium (Cd)	< 0.41 ppm	
Lead (Pb)	18.5 ppm	
Total Mercury (Hg)	< 0.04 ppm	

2002-2005 Fertilizer Heavy Metal Analysis Summary

Minnesota Department of Agriculture, Agronomy and Plant Protection Division

Chevron Chemical Company
Ortho Consumer Products Division
San Francisco, CA 94120

AFZ-02-0004

Aluminum Sulfate (Fertilizer, Dry)

sampled
04/29/2002

Analyte	Found	Claim
Arsenic (As)	5.40 ppm	
Cadmium (Cd)	< 0.40 ppm	
Lead (Pb)	13.8 ppm	
Total Mercury (Hg)	< 0.04 ppm	

2002-2005 Fertilizer Heavy Metal Analysis Summary

Minnesota Department of Agriculture, Agronomy and Plant Protection Division

Dragon Corporation
PO Box 7311
Roanoke, VA 24019-7311

sampled
05/29/2002

AFZ-02-0024

Dragon Aluminum Sulphate (Fertilizer, Dry)

Analyte	Found	Claim
Arsenic (As)	0.42 ppm	
Cadmium (Cd)	< 0.40 ppm	
Lead (Pb)	0.91 ppm	
Total Mercury (Hg)	< 0.04 ppm	

2002-2005 Fertilizer Heavy Metal Analysis Summary

Minnesota Department of Agriculture, Agronomy and Plant Protection Division

Farmer's Mill & Elevator
27920 Danville Avenue, PO Box 488
Castle Rock, MN 55010

AFZ-05-0007

FMX 20-3-20 (Fertilizer, Dry)

sampled
08/18/2005

Analyte	Found	Claim
Total Nitrogen (N)	20.9 %	20 %
Available Phosphate (P ₂ O ₅)	0.29 %	3.0 %
Soluble Potash (K ₂ O)	18.0 %	20 %
Sulfur (S)	8.09 %	6.68 %
Iron (Fe)	2.58 %	3.0 %
Zinc (Zn)	0.13 %	
Arsenic (As)	1.24 ppm	
Cadmium (Cd)	< MRL (0.81 ppm)	
Lead (Pb)	11.7 ppm	
Total Mercury (Hg)	<0.01 ppm	

2002-2005 Fertilizer Heavy Metal Analysis Summary

Minnesota Department of Agriculture, Agronomy and Plant Protection Division

FerroGrow Botswana LTD
Kuba Road, Broadhurst Industrial
Gaboron, Botswana, Africa

AFZ-04-0001

FerroGrow 5-5-2 (Fertilizer, Dry)

sampled
08/20/2004

Analyte	Found	Claim
Total Nitrogen	2.73 %	5.0 %
Available Phosphate (P2O5)	5.28 %	5.0 %
Soluble Potash (K2O)	2.47 %	2.5 %
Iron	10.4 %	7.6 %
Magnesium	0.723 %	5.6 %
Sulfur	7.35 %	6.0 %
Arsenic	< MRL (0.4 ppm)	
Cadmium	11.0 ppm	
Lead	25.0 ppm	
Total Mercury	0.051 ppm	

2002-2005 Fertilizer Heavy Metal Analysis Summary

Minnesota Department of Agriculture, Agronomy and Plant Protection Division

Form-A-Feed
740 Bowman Street, PO Box 9
Stewart, MN 55385

AFZ-05-0005 Greener Pastures Humic Plus 8-0-5 (Fertilizer, Dry) sampled
06/22/2005

Analyte	Found	Claim
Total Nitrogen (N)	8.59 %	8.0 %
Soluble Potash (K ₂ O)	5.20 %	5.0 %
Iron (Fe)	2.10 %	2.0 %
Arsenic (As)	< MRL (0.79 ppm)	
Cadmium (Cd)	< MRL (0.79 ppm)	
Lead (Pb)	1.89 ppm	
Total Mercury (Hg)	<0.01 ppm	

AFZ-05-0006 Bladerunner 12-0-9 (Fertilizer, Dry) sampled
06/22/2005

Analyte	Found	Claim
Total Nitrogen (N)	12.8 %	12 %
Soluble Potash (K ₂ O)	8.72 %	9.0 %
Iron (Fe)	2.11 %	2.0 %
Arsenic (As)	< MRL (0.76 ppm)	
Cadmium (Cd)	< MRL (0.76 ppm)	
Lead (Pb)	1.88 ppm	
Total Mercury (Hg)	<0.01 ppm	

2002-2005 Fertilizer Heavy Metal Analysis Summary

Minnesota Department of Agriculture, Agronomy and Plant Protection Division

Frit Industries
PO Box 1589
Ozark, AL 36361

AFZ-02-0009

Iron 50% (Fertilizer, Dry)

sampled
05/09/2002

Analyte	Found	Claim
Iron (Fe)	47.8 %	50 %
Arsenic (As)	17.9 ppm	
Cadmium (Cd)	4.11 ppm	
Lead (Pb)	278 ppm	
Total Mercury (Hg)	0.064 ppm	

2002-2005 Fertilizer Heavy Metal Analysis Summary

Minnesota Department of Agriculture, Agronomy and Plant Protection Division

Glorious Gardens, Inc.
PO Box 3628
Des Moines, IA 50322

AFZ-02-0005

Glorious Gardens Magnesium Sulfate (Fertilizer, Dry)

sampled
05/01/2002

Analyte	Found	Claim
Magnesium (Mg)	0.03 %	16 %
Sulfur (S)	15.9 %	22 %
Arsenic (As)	< 0.41 ppm	
Cadmium (Cd)	< 0.41 ppm	
Lead (Pb)	1.79 ppm	
Total Mercury (Hg)	< 0.04 ppm	

2002-2005 Fertilizer Heavy Metal Analysis Summary

Minnesota Department of Agriculture, Agronomy and Plant Protection Division

Ironite Products Company 8700 Via de Ventura, Suite 280 Scottsdale, AZ 85258

AFZ-02-0001	Ironite 1-0-0 (Fertilizer, Dry)	sampled 05/27/2002
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Analyte	Found	Claim
Total Nitrogen (N)	2.2 %	1.0 %
Sulfur (S)	13.1 %	5.0 %
Iron (Fe)	11.7 %	4.5 %
Arsenic (As)	3870 ppm	
Cadmium (Cd)	45.3 ppm	
Lead (Pb)	3290 ppm	
Total Mercury (Hg)	10.1 ppm	

AFZ-02-0021	Ironite 1-0-0 (Fertilizer, Dry)	sampled 04/15/2002
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Analyte	Found	Claim
Total Nitrogen (N)	1.9 %	1.0 %
Calcium (Ca)	3.48 %	1.0 %
Magnesium (Mg)	1.94 %	1.0 %
Sulfur (S)	11.6 %	5.0 %
Iron (Fe)	11.8 %	4.5 %
Arsenic (As)	4520 ppm	
Cadmium (Cd)	47.4 ppm	
Lead (Pb)	2780 ppm	
Total Mercury (Hg)	7.34 ppm	

AFZ-03-0002	Ironite 1-0-0 (Fertilizer, Dry)	sampled 10/09/2003
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Analyte	Found	Claim
Total Nitrogen	1.6 %	1.0 %
Iron	12.7 %	4.5 %
Arsenic	3815 ppm	
Cadmium	47.2 ppm	
Lead	4210 ppm	
Total Mercury	10.755 ppm	

AFZ-05-0001	Ironite Plus 12-10-10 (Fertilizer, Dry)	sampled 04/07/2005
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Analyte	Found	Claim
Total Nitrogen	12.0 %	12 %
Available Phosphate (P2O5)	10.9 %	10 %
Soluble Potash (K2O)	9.29 %	10 %
Iron (Fe)	1.60 %	0.7 %
Sulfur (S)	12.0 %	12 %
Arsenic (As)	312 ppm	
Cadmium (Cd)	6.93 ppm	
Lead (Pb)	344 ppm	
Total Mercury (Hg)	1.816 ppm	

AFZ-05-0002	Ironite Plus Lawn & Garden Spray 6-2-1 (Fertilizer, Liquid)	sampled 04/07/2005
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Analyte	Found	Claim
Total Nitrogen (N)	8.26 %	6.0 %
Available Phosphate (P2O5)	1.92 %	2.0 %
Soluble Potash (K2O)	2.29 %	1.0 %
Iron (Fe)	0.563 %	0.6 %
Sulfur (S)	0.954 %	1.0 %
Arsenic (As)	< MRL 0.8	
Cadmium (Cd)	< MRL 0.8	
Lead (Pb)	< MRL 0.8	
Total Mercury (Hg)	<0.01 ppm	

2002-2005 Fertilizer Heavy Metal Analysis Summary

Minnesota Department of Agriculture, Agronomy and Plant Protection Division

Ironite Products Company
8700 Via de Ventura, Suite 280
Scottsdale, AZ 85258

AFZ-05-0003

Ironite Plus Plant & Flower Food 7-6-6 (Fertilizer, Liquid)

sampled
04/07/2005

Analyte	Found	Claim
Total Nitrogen (N)	8.12 %	7.0 %
Available Phosphate (P2O5)	5.86 %	6.0 %
Soluble Potash (K2O)	6.11 %	6.0 %
Iron (Fe)	0.156 %	0.1 %
Sulfur (S)	0.858 %	1.0 %
Arsenic (As)	< MRL 0.8	
Cadmium (Cd)	1.45 ppm	
Lead (Pb)	< MRL 0.8	
Total Mercury (Hg)	<0.01 ppm	

AFZ-05-0004

Ironite 7-6-6 (Fertilizer, Dry)

sampled
04/07/2005

Analyte	Found	Claim
Total Nitrogen (N)	7.31 %	7.0 %
Available Phosphate (P2O5)	8.73 %	6.0 %
Soluble Potash (K2O)	7.49 %	6.0 %
Iron (Fe)	7.18 %	6.0 %
Sulfur (S)	8.22 %	10 %
Arsenic (As)	2.10 ppm	
Cadmium (Cd)	4.05 ppm	
Lead (Pb)	13.0 ppm	
Total Mercury (Hg)	0.080 ppm	

2002-2005 Fertilizer Heavy Metal Analysis Summary

Minnesota Department of Agriculture, Agronomy and Plant Protection Division

Lawn and Garden Products, Inc.
3654 Willow Avenue S, PO Box 35000
Fresno, CA 93745

AFZ-02-0022

Dr Iron 22% Iron (Fertilizer, Dry)

sampled
04/16/2002

Analyte	Found	Claim
Sulfur (S)	50.2 %	55 %
Iron (Fe)	21.2 %	22 %
Arsenic (As)	2.22 ppm	
Cadmium (Cd)	< 0.40 ppm	
Lead (Pb)	3.09 ppm	
Total Mercury (Hg)	< 0.04 ppm	

2002-2005 Fertilizer Heavy Metal Analysis Summary

Minnesota Department of Agriculture, Agronomy and Plant Protection Division

Midwestern Bio-Ag Products and Services
Highway 1D, PO Box 160
Blue Mounds, WI 53517

AFZ-02-0012 Vol Cana Phos (Fertilizer, Dry) sampled
05/03/2002

Analyte	Found	Claim
Available Phosphate (P2O5)	3.90 %	3.0 %
Arsenic (As)	0.45 ppm	
Cadmium (Cd)	0.50 ppm	
Lead (Pb)	100 ppm	
Total Mercury (Hg)	< 0.04 ppm	

AFZ-02-0028 Daphos (Fertilizer, Dry) sampled
03/15/2002

Analyte	Found	Claim
Available Phosphate (P2O5)	7.74 %	3.0 %
Arsenic (As)	11.7 ppm	
Cadmium (Cd)	46.0 ppm	
Lead (Pb)	12.2 ppm	
Total Mercury (Hg)	0.256 ppm	

2002-2005 Fertilizer Heavy Metal Analysis Summary

Minnesota Department of Agriculture, Agronomy and Plant Protection Division

R S A Microtech, Inc.
101 Elliot Ave West #110
Seattle, WA 98119

AFZ-02-0013

Copper Sulfate (Fertilizer, Dry)

sampled
05/06/2002

Analyte	Found	Claim
Sulfur (S)	6.14 %	6.0 %
Copper (Cu)	5.48 %	5.0 %
Arsenic (As)	0.67 ppm	
Cadmium (Cd)	< 0.41 ppm	
Lead (Pb)	32.9 ppm	
Total Mercury (Hg)	< 0.04 ppm	

2002-2005 Fertilizer Heavy Metal Analysis Summary

Minnesota Department of Agriculture, Agronomy and Plant Protection Division

Schultz Company
13260 Corporate Exchange Drive
Saint Louis, MO 63044

AFZ-02-0016

Schultz Iron Green (Fertilizer, Liquid)

sampled
04/30/2002

Analyte	Found	Claim
Total Nitrogen (N)	8.5 %	8.0 %
Magnesium (Mg)	1.1 %	1.0 %
Sulfur (S)	3.84 %	5.0 %
Iron (Fe)	6.47 %	6.0 %
Arsenic (As)	< 0.41 ppm	
Cadmium (Cd)	< 0.41 ppm	
Lead (Pb)	0.92 ppm	
Total Mercury (Hg)	< 0.04 ppm	

2002-2005 Fertilizer Heavy Metal Analysis Summary

Minnesota Department of Agriculture, Agronomy and Plant Protection Division

Sims-Ag Products
3795 County Road 29
Mount Gilead, OH 43338

AFZ-02-0019

Bin Buster Micros Vegi Max Micro Mix (Fertilizer, Dry)

sampled
05/02/2002

Analyte	Found	Claim
Sulfur (S)	14.0 %	12 %
Boron (B)	0.42 %	1.0 %
Iron (Fe)	3.56 %	4.0 %
Manganese (Mn)	7.51 %	5.0 %
Zinc (Zn)	14.9 %	12 %
Arsenic (As)	133 ppm	
Cadmium (Cd)	56.5 ppm	
Lead (Pb)	776 ppm	
Total Mercury (Hg)	10.2 ppm	

2002-2005 Fertilizer Heavy Metal Analysis Summary

Minnesota Department of Agriculture, Agronomy and Plant Protection Division

Southern Agricultural Insecticides, Inc.
PO Box 218
Palmetto, FL 34220

AFZ-02-0020

Magnesium Sulfate (Fertilizer, Dry)

sampled
04/22/2002

Analyte	Found	Claim
Magnesium (Mg)	9.89 %	16 %
Arsenic (As)	< 0.40 ppm	
Cadmium (Cd)	< 0.40 ppm	
Lead (Pb)	1.75 ppm	
Total Mercury (Hg)	0.073 ppm	

2002-2005 Fertilizer Heavy Metal Analysis Summary

Minnesota Department of Agriculture, Agronomy and Plant Protection Division

Specialty Turf and Ag Inc.- Albany
1600 Railroad Avenue
Albany, MN 56307

AFZ-04-0002

Specialty Seeds Fertilizer (Fertilizer, Dry)

sampled
10/08/2004

Analyte	Found	Claim
Total Nitrogen	24.3 %	24 %
Available Phosphate (P2O5)	0.16 %	0.0 %
Soluble Potash (K2O)	11.6 %	12 %
Arsenic	< MRL (0.4 ppb)	
Cadmium	0.88 ppb	
Lead	3.98 ppb	
Total Mercury	0.016 ppm	

AFZ-04-0003

Specialty Seeds Fertilizer (Fertilizer, Dry)

sampled
10/11/2004

Analyte	Found	Claim
Total Nitrogen	23.6 %	24 %
Available Phosphate (P2O5)	2.37 %	0.0 %
Soluble Potash (K2O)	14.2 %	12 %
Arsenic	0.66 ppb	
Cadmium	0.51 ppb	
Lead	1.80 ppb	
Total Mercury	0.013 ppm	

2002-2005 Fertilizer Heavy Metal Analysis Summary

Minnesota Department of Agriculture, Agronomy and Plant Protection Division

Voluntary Purchasing Groups, Inc.
Highway 82 West, PO Box 460
Bonham, TX 75418

AFZ-02-0002 Soil Sulphur (Fertilizer, Dry) sampled
04/29/2002

Analyte	Found	Claim
Sulfur (S)	81.7 %	90 %
Arsenic (As)	0.65 ppm	
Cadmium (Cd)	< 0.41 ppm	
Lead (Pb)	1.54 ppm	
Total Mercury (Hg)	< 0.04 ppm	

AFZ-02-0003 Agricultural Limestone (Fertilizer, Dry) sampled
04/29/2002

Analyte	Found	Claim
Calcium (Ca)	39.7 %	21 %
Magnesium (Mg)	0.23 %	13 %
Lead (Pb)	2.38 ppm	
Arsenic (As)	1.42 ppm	
Cadmium (Cd)	< 0.40 ppm	
Total Mercury (Hg)	< 0.04 ppm	

AFZ-02-0015 Aluminum Sulfate (Fertilizer, Dry) sampled
04/29/2002

Analyte	Found	Claim
Sulfur (S)	14.3 %	14 %
Arsenic (As)	< 0.41 ppm	
Cadmium (Cd)	< 0.41 ppm	
Lead (Pb)	5.37 ppm	
Total Mercury (Hg)	< 0.04 ppm	

AFZ-02-0029 Fertilome Liquid Iron (Fertilizer, Liquid) sampled
04/11/2002

Analyte	Found	Claim
Iron (Fe)	2.98 %	3.25 %
Arsenic (As)	0.39 ppm	
Cadmium (Cd)	0.23 ppm	
Lead (Pb)	0.30 ppm	
Total Mercury (Hg)	< 0.04 ppm	

AFZ-02-0030 Hi Yield Ionate & Soil Acidifier (Fertilizer, Dry) sampled
04/11/2002

Analyte	Found	Claim
Total Nitrogen (N)	13.1 %	11 %
Sulfur (S)	15.4 %	13 %
Iron (Fe)	14.7 %	16 %
Arsenic (As)	2.72 ppm	
Cadmium (Cd)	11.9 ppm	
Lead (Pb)	112 ppb	
Total Mercury (Hg)	6.75 ppm	

AFZ-02-0031 Hi yield Copperus (Fertilizer, Dry) sampled
04/11/2002

Analyte	Found	Claim
Sulfur (S)	12.4 %	11 %
Iron (Fe)	20 %	19 %
Arsenic (As)	< 0.50 ppm	
Cadmium (Cd)	< 0.50 ppm	
Lead (Pb)	0.26 ppm	
Total Mercury (Hg)	< 0.04 ppm	